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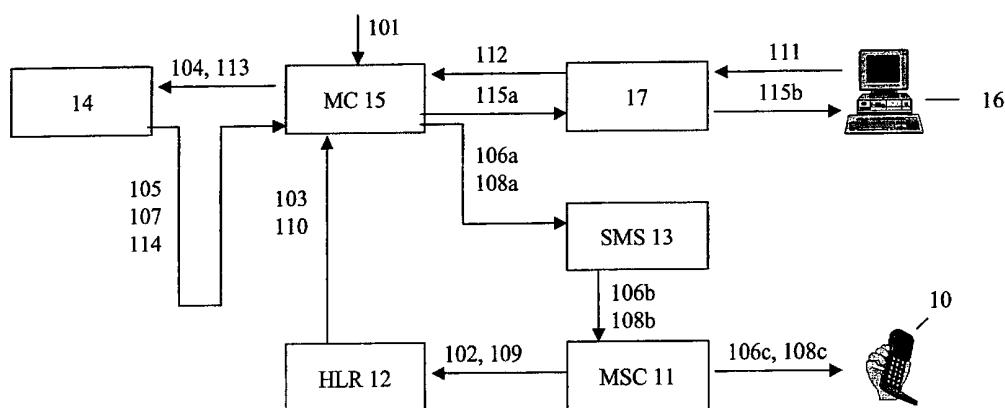
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(54) Title: METHOD IN A MESSAGING SERVICE PROVIDED VIA THE TELECOMMUNICATION NETWORK



(57) Abstract: The invention relates to a method for controlling data communications in a telecommunications network, in which at least two separate addresses in a set of addresses are set as customer-identity-specific destination addresses in the telecommunications network. In the method, a destination-address databank is maintained, in which data is maintained customer-identity specifically, of which of the network addresses defined as destination addresses have the desired type of data communications connection to the telecommunications network. A priority order for the destination addresses is also maintained in the destination-address database. The destination address, for which the highest priority is defined, which has the desired type of data communications connection to the telecommunications network, is retrieved from the databank, after which the data communications being controlled are sent to this address.



WO 01/69902 A1

Method in a Messaging Service Provided via the Telecommunication Network

The present invention relates to a method, according to the preamble of Claim 1, for controlling data communications in a telecommunications network, in which method at least two addresses in a set of addresses are set as customer-specific destination addresses in the telecommunications network. These addresses are network-addresses used in the telecommunications network. Such a destination address can be, for example, an address in a packet-switched network, such as an IP network, or an address in a circuit-switched network, such as a telephone number of a public telephone network (PSTN) or a mobile network (PLMN).

Various kinds of message services are implemented in telecommunications networks. In these message services, a contact-attempt message notifying of a failed contact attempt is recorded in the telecommunications network, if the telecommunications network does not receive the desired type of response signal from the destination identity. Notification of the existence of contact-attempt messages, which can contain at least part of the message, is delivered later to at least one network address defined in a contactability profile. A contact-attempt message can be, for example, a voice message, which is received from the connection that has sent the call, i.e. a data communications connection formation request, for example, a call-connection request. The contact-attempt message can also be a standard message stored in the telecommunications network.

A contactability service is a service, provided with the aid of a contactability profile set in a telecommunications network, for contacting a destination defined in a contactability profile. A contactability profile is a definition, stored in the telecommunications network, containing the network identity, i.e. the network address, of at least one receiving connection, on the basis of which the telecommunications network directs a data communications connection to be formed between at least one calling subscriber connection and at least one receiving connection. A contactability profile can also limit the permitted network addresses of a calling subscriber connection.

One form of contactability profile is a contactability chain. This refers to a series of

receiving connection network identities stored in a telecommunications network, the connections corresponding to which are sent a call-connection request in response to a connection-formation request received from a calling subscriber connection. The connection-formation requests are sent in the order according to the series. This is continued until a signal is received from one of the network addresses belonging to the relevant contactability chain, directing the telecommunications network to form a data communications connection between the calling subscriber connection and at least one connection of the relevant contactability chain, or until the entire contactability chain has been gone through, without a response signal corresponding to that described being received from any of the defined connections.

A drawback of the state of the art is the distribution of the notification of the existence of a contact-attempt message. It is wished for customers utilizing the message service to be able to read notifications of the existence of contact-attempt messages from several terminal devices. This is the case, for example, in situations in which a customer uses a work station and a mobile station and it is wished for the customer to receive notification of the existence of a contact-attempt message from whichever terminal device they happen to be using. In the state of the art, notification of the existence of a contact-attempt message is sent to all the terminal devices from which it is desired for the customer to be able to read it, thus burdening the customer with the need to acknowledge unnecessary notifications of the existence of contact-attempt messages. In known contactability services, the system of the telecommunications network that sends call-formation requests to the destination addresses does not include information as to which of the network addresses defined in the contactability profile are connected to the telecommunications network over the desired kind of data communications connection. Thus contactability chains are used and an additional load is placed on the telephone network by call-formation requests that are sent to network address from which there is even no possibility of obtaining the desired kind of response. In addition, users of the telecommunications network must wait longer for calls to be formed.

The invention is intended to eliminate the defects of the state of the art disclosed above and for this purpose create an entirely new type of method for controlling data communications in a telecommunications network.

The invention is based on maintaining a destination-address database, in which customer-identity-specific information is maintained as to which of the network addresses defined as destination addresses are connected to the telecommunications network over the desired kind of data communications connection. A priority order for the destination addresses is also maintained in the destination-address database. The destination address for which the highest priority has been set and which is connected to the telecommunications network over the desired kind of data communications connection is retrieved from the database, after which the data communications being routed is sent to this address.

More specifically, the method according to the invention for controlling data communications in a telecommunications network is characterized by what is stated in the characterizing portion of Claim 1.

Considerable advantages are gained with the aid of the invention. The need to acknowledge unnecessary notifications of the existence of contact-attempt messages is eliminated, thus reducing the number of operations required to be carried out by the user of a contactability service and correspondingly lightening the load on the telecommunications network. The use of contactability chains is replaced by using the method according to the invention to route data communications in a telecommunications network, thus eliminating the additional load caused by the use of contactability chains and shortening the call formation time experienced by customers of the telecommunications network.

In the following, the invention is examined with the aid of examples and with reference to the accompanying drawing.

Figure 1 shows one method according to the invention for controlling data communications in a message service implemented in a telecommunications network.

In the method of Figure 1, a destination address database is maintained in the telecommunication network, in which the possible destination addresses for contact-

attempt messages are defined to form customer-identity-specific message-management data structures. A priority order is defined for the destination addresses in the message-management data structures, as well as information on whether the terminal device connected to a specific address has the desired kind of data communications connection in the telecommunications network. In the case of a message service, the desired kind of data communications connection is a connection, for the duration of which a message containing notification of the existence of a contact-attempt message can be received at the destination address. Such a connection can be, for example, the signalling connection of a mobile station. The message-management structure can be, for example, a table like that below, or some other data structure possessing a corresponding functionality:

Message form A (e.g., ordinary voice message):

Customer identity	X		
	Destination address	Data communications connection	Priority
GSM number	Y	On/off	1
IP address	a.b.c.d	On/off	2
E-mail address	i.j@k	On	3

Message form B (e.g., video message):

Customer identity	X		
	Destination address	Data communications connection	Priority
UMTS number	Y	On/off	1
Home PC's IP address	a.b.c.d	On/off	2
Reserve destination	e.f.g.h	On/off	3

E-mail address	i.j@k	On	4
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Message form C (ordinary e-mail):

Customer identity	X		
	Destination address	Data communications connection	Priority
UMTS number	Y	On/off	2
Reserve destination	e.f.g.h	On/off	3
E-mail address	i.j.@k	On	1

On = the device is switched on and is connected to the network and/or has an adequate connection (transmission band).

Off = the device is switched off and is disconnected from the network and/or the connection is inadequate in relation to the application (transmission band).

Figure 1 has the following numbered elements.

The mobile station connection 10 is a connection in a GSM network. The MSC centre 11 is one mobile switching centre, while the home register of the mobile station connection 10 is in the HLR centre 12. The SMS centre 13 is a centre that relays short messages in the mobile network. The message server 14 is a system, in which contact-attempt messages are stored. The control system MC is a system, in which specific network addresses and data on the state of specific data communications connections in telecommunications networks are maintained. The specific data communications connections are data communications connections formed from specific network addresses, these specific network addresses being defined as possible destination addresses for notifications of the existence of contact-attempt messages. The MC 15 and/or the message server 14 can also be elements that are implemented by means of software. The IP terminal device 16 is a work station, mobile station, or other device

connected to the IP network. The IP server 17 is a server, which is set to monitor data communications directed to the IP address of the IP terminal device and/or sent from the IP address of the IP terminal device.

The method according to Figure 1 has the following stages. Stage 101 is carried out to define the desired kind of control logic for the message server:

- 101) The identity of the mobile station connection 10 and the IP address of the IP terminal device 16 are set as customer-identity-specific destination addresses in the message-management data structure of the MC 15. In addition to this, the identity of the mobile station connection 10 is set to have the first priority and the IP address of the IP terminal device 16 is set to have the second priority in the message-management data structure.

Stages 102 - 104 are carried out to set the control system MC 15 to a state corresponding to the state of the data communications connection of the mobile station connection 10.

- 102) A signal coming from the MSC centre 11, which notifies that the mobile station connection has connected to the mobile network over a signalling connection, is received in the HLR centre 12.
- 103) Notification of the connection of the mobile station connection 10 over a signalling connection is forwarded from the HLR centre 12 to the MC 15.
- 104) In response to the notification received, the MC 15 is set to a state that shows that the mobile station connection 10 has a signalling connection and a request is sent from the MC 15 to the message server 14 for contact-attempt messages directed to a specific customer identity. The state referred to can be defined by setting the data communications connection element linked to the identity of the mobile station connection 10, such as the GSM number, to an on-state in the message-management data structure.

Stages 105 - 106 are carried out to send notifications of the existence of contact-attempt

messages, directed to the customer identity, to the direction of the mobile station connection 10.

- 105) Notification of the existence of at least one contact-attempt message, sent from the message server 14, is received in the MC 15.
- 106) Notification of the existence of at least one contact-attempt message is sent (stages 106a - 106c) from the MC 15, through the SMS centre 13 and the MSC centre 11, to the direction of the mobile station connection 10.

If after this, a contact-attempt message, for which the method according to the invention for controlling a message service is set, directed to the customer identity is stored in the message sever 14, stages 107 and 108 of the method are carried out.

- 107) Notification of the existence of the contact-attempt message is received in the MC 15 and the first destination address in the priority order, the data communications connection element of which is in the on state, is retrieved by means of the MC 15 from the destination address database. Thus, the destination address retrieved is the identity of the mobile station connection 10.
- 108) Notification of the existence of the contact-attempt message is sent (stages 108a - 108c) from the MC 15, through the SMS centre 13 and the MSC centre 11, to the direction of the mobile station connection 10.

If the signalling connection of the mobile station connection 10 to the telecommunications network breaks, the following stages of the method are carried out.

- 109) Notification of the break in the signalling connection to the mobile station connection 10 is received in the HLR centre 12 from the MSC centre 11.
- 110) Notification of the break in the signalling connection to the mobile station connection 10 is received in the MC 15 from the direction of the HLR 12. In response to the notification received, the MC 15 is set to a state that shows that

the mobile station connection 10 has no signalling connection. The state referred to can be defined by setting the data communications connection element, linked to the identity such as the GSM number of the mobile station connection 10, in the message-management data structure, to the off state.

After this, messages notifying of the existence of contact-attempt messages stored in the message server 14 are sent to the destination defined in the customer-identity-specific message-management data structure, which is first in the order of priority of the destinations set in an on state. If all the destinations defined in the message-management data structure are in an off state, notification of the existence of a contact-attempt message is left in the message server 14 or the MC 15, to await the destination defined in the message-management data structure being set to the on state.

When the IP terminal device 16 defined in the message-management data structure as the destination is connected to the telecommunications network, the following operations are carried out:

- 111) The IP server 17 detects the connection of the IP terminal device 16 over the desired type of data communications connection.
- 112) A message is received in the MC 15, from the direction of the IP sever 17, stating that there is a data communications connection of the desired type to the IP terminal device 16.
- 113) In response to the received message, the MC 15 is set to a state that shows that the IP terminal device is connected over the desired kind of data communications connection. After this, a request is sent from the MC 15 to the message server 14 for contact-attempt messages directed to the specific customer identity. The state referred to can be defined by setting to the on state the data communications connections element in the message-management data structure connected to the IP address of the IP terminal device 16.
- 114) Notification of at least one contact-attempt message, sent from the message

server 14, is received in the MC 15.

- 115) Notification of the existence of at least one possible contact-attempt message is sent (stages 115a - 115b), through the IP server 17, to the direction of the of the IP terminal device 16.

After this, message notifying of the existence of the contact-attempt messages stored in the message server 14 are sent to the IP terminal device 16, if this is the first of the destinations set to an on state in the priority order in the message-management data structure. Notification of the possible exiting of the IP terminal device 16 from the desired type of data communications connection is sent by the control system from the MC 15 in the order according to the stages 111 - 113 of the method.

Users of the tele-services can be provided with the possibility to alter the message-management data structure linked to their customer identity in the control system MC 15. In such cases, the destination addresses of the message-management data structure and their priorities are set by means of reception control through a DTMF, WAP, or Web interface.

A customer-identity-specific contact-attempt message can be formed directly to the message server 14 or recursively to a specific destination address or to one of the specific destination addresses, as a result of a directed data communications connection formation request. A contact-attempt message can be formed to the message server 14, if the desired type of response is not received in the telecommunications network from the destination address. In certain systems, this requires active operations from the direction of the element that sent the data communications connection formation request.

Embodiments of the invention, differing from those disclosed above, can also be envisaged within the scope of the invention. A contactability service can be set to operate with the aid of the method according to the invention. In that case, the data communications connection formation requests are directed to the precise desired destination address by means of a series of operations corresponding to that used in the example for directing the notification of the existence of contact-attempt messages. The

message-management data structure disclosed above is used as the contactability profile, the data communications connection formation request directed to the customer identity being directed to the active destination identity with the highest priority in the message management data structure. In the case of a contactability service, the desired type of data communications connection is such that the logic operating in the direction of the destination identity can be interpreted on the basis of the state of the data communications connection as being ready to receive a data communications connection formation request according to the contactability profile.

The invention is mainly intended for routing or forwarding fixed-mode data communications to a destination address. In this case, fixed-mode data communications refers to short messages, e-mail message, or similar messages.

In this connection, the term set of addresses refers, for example, to the numerical space of a telephone network or, for example, to the IP address structure of an IP network. In this case, the term address refers to a user-specific indicator in the relevant set of addresses. For example, a telephone number in a telephone network.

In this connection, the term desired type of data communications connection refers to such a data communications connection, through which data communications can be sent to a user. The data communications to be sent is typically in the same form as the message that is stored in the message store being used. In an embodiment, in which the type of message is changed for sending to the customer, the desired type of data communications connections can also refer to a type of connection used to send a converted message. For example, a live-video-mode message can be sent to a UMTS terminal device or a PC, but not to a conventional land-line telephone or a conventional GSM telephone.

Claims:

1. A method for controlling data communications in connection with a message service implemented in a telecommunications network, in which method

- at least two addresses of separate sets of addresses are set (101) as the customer-identity-specific destination addresses for the customer of the message service of the telecommunications network,
- a message directed to the customer of the message service is received in the message service,
- data communications, which contain the received message, or at least a notification of a contact-attempt message, are sent to the customer at the customer-identity-specific destination address,

characterized in that

- the type of data communications connection, desired for the data communications to be sent, is defined in the message service,
- the destination addresses are set (101) in a priority order in the message service and data is maintained on which of the destination addresses have the desired type of data communications connection,
- the first destination address in the priority order, to which there is the desired type of data communications connection, is selected from the group of customer-identity-specific destination addresses, and
- data communications, which contain the received message, or at least a notification of a contact-attempt message, are sent (106) to the selected destination address.

2. A method according to Claim 1, **characterized** in that, when data is maintained, in the control system (15) operating in the telecommunications network, on which of the destination addresses have the desired type of data communications connection,

- a mobile station connection identity, such as a mobile station connection number, is set (101) as the customer-identity-specific destination address,
- notification is received (103) in the control system (15) of the connection of the mobile station connection (10) to the mobile network over a signalling connection, or of its disconnection from the signalling connection from the

mobile network, and

- in response to the notification received, the control system (15) is set (104) to a state that shows that the mobile station connection (10) is either connected over a signalling connection or is disconnected from the signalling connection.

3. A method according to Claim 1 or 2, **characterized** in that, when data is maintained, in the control system (15) operating in the telecommunications network, on which of the destination addresses have the desired type of data communications connection,

- a specific IP address is set (101) as the destination address,
- information is received (112) in the control system (15) from the direction of the IP server (17) as to whether there is the desired type of data communications connection to the specific IP address, or whether there is not the desired type of data communications connection to the specific IP address, and
- in response to the received information, the control system (15) is set (113) to a state that show that either there is the desired type of data communications connection to the specific IP address, or that there is not the desired type of data communications connection to the specific IP address.

4. A method according to one of Claims 1 - 3, **characterized** in that, when data communications are sent to the first destination address in the priority order, which has the desired type of data communications connection,

- notification of the existence of at least one possible contact-attempt message is received (107) in the control system (15) from the direction of the message server (14),
- the first destination address in the priority order, which has the desired type of data communications connection, is retrieved (107) from the control system (15), and
- the telecommunications network is directed (108) to send the data communications being controlled, to the retrieved destination address.

5. A method according to one of Claims 1 - 4, **characterized** in that at least one

destination address is set in response to control received through a customer interface of the control system (15), such as a DTMF, WAP, or WWW interface.

6. A method according to one of Claims 1 - 5, **characterized** in that the priority order of the destination addresses is modified in response to control received through a customer interface, such as a DTMF, WAP, or WWW interface.

7. A method according to one of Claims 1 - 6, **characterized** in that, at least one destination address is an address in a switched telephone network and at least one other destination address is other than an address in a switched telephone network, for example, an IP address.

8. A method according to one of Claims 1 - 7, **characterized** in that the data communications being controlled are in a fixed mode, such as SMS short-message mode.

9. A method according to one of Claims 1 - 8, **characterized** in that the message service is voice mail.

10. A method according to one of Claims 1 - 8, **characterized** in that messages in at least two message modes are received in the message service.

11. A method according to Claim 10, **characterized** in that messages in at least three message modes, from the group video image, data message, SMS message, and voice mail, are received in the message service.

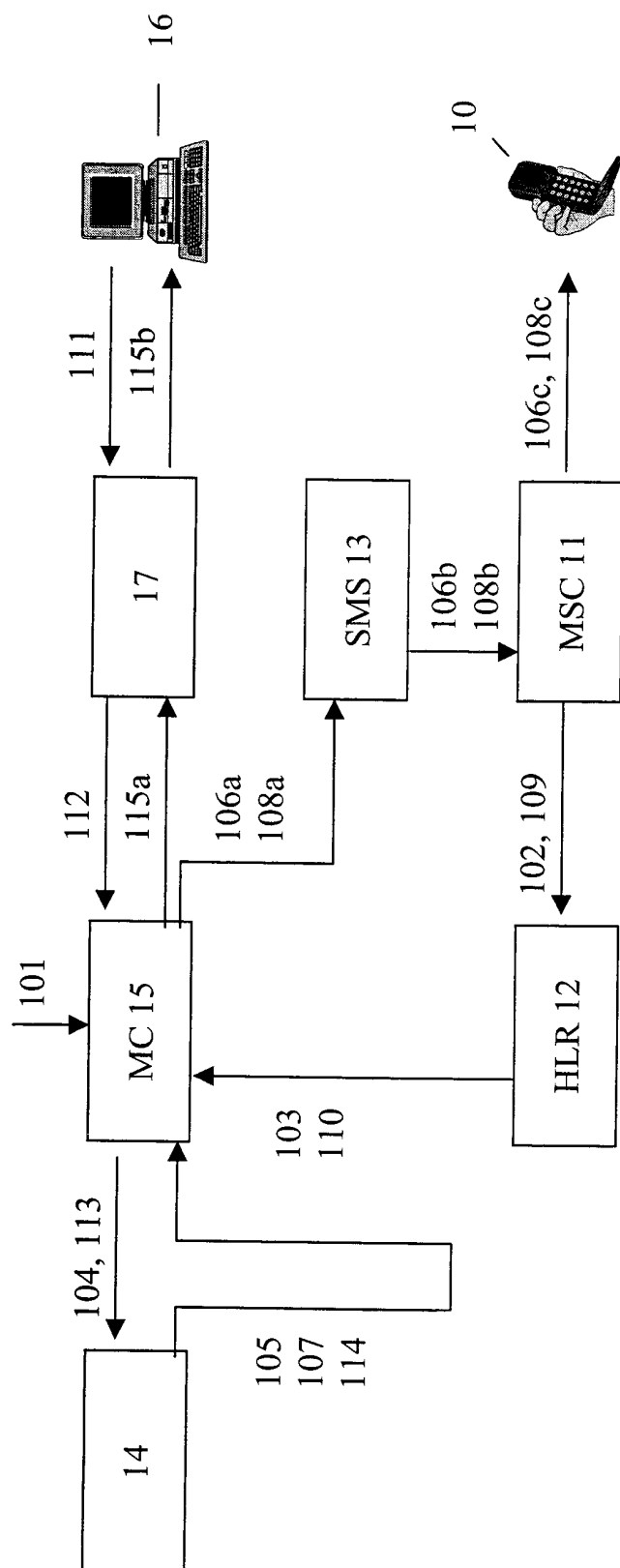
12. A method according to one of Claims 1 - 11, **characterized** in that the received message is modified and the modified message is sent to the destination address.

13. A method according to one of Claims 1 - 12, **characterized** in that the message type of the received message is changed in the message service and the message is sent to the destination address in a mode according to the new message type.

14. A method according to one of Claims 1 - 13, characterized in that the message service includes a separate destination-address priority order for each type of message.

1/1

Fig. 1



INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04M 3/42, H04Q 3/00, H04L 12/56, H04L 12/66, H04L 29/02, H04Q 7/22
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04L, H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	WO 9821911 A1 (TELEFONAKTIEBOLAGET LM ERICSSON), 22 May 1998 (22.05.98), figure 1, abstract --	1-14

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

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